CHAPTER 3

Renewable Energy

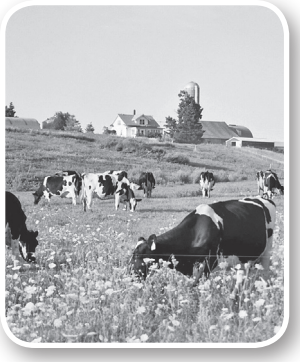
A Quick Guide to Renewable Energy

Biomass is organic matter (plant material, vegetation, agriculture waste, forestry waste) used as a fuel or source of energy. Use of biomass as an energy source results in little net production of carbon dioxide because the CO_2 generated during combustion of plant material equals the CO_2 consumed during the lifecycle of the plant. A map of biomass density across the United States can be found in the Map Appendix.

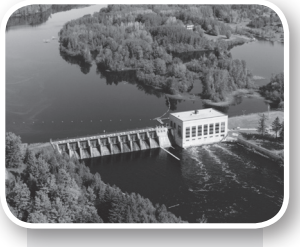
Renewable energy resources play a key role in Wisconsin's efforts to achieve the Governor's 25 x '25 goal, and to reduce dependence on imported fuels. According to Wisconsin Statutes 196.374(1)(j), a renewable resource "derives energy from any source other than coal, petroleum products, nuclear power, or …natural gas."

Wind power uses turbines to generate electricity for distribution on the electric grid and/or to displace energy normally purchased from the grid. A map of wind production sites and wind energy potential across Wisconsin can be found in the Map Appendix.

Biogas is produced from the state's landfills and agricultural manure digesters. Often, biogas is included under the heading biomass. In this statistics book, we break out biogas from biomass to provide further definition and detail about these resources in the state.



Solar thermal uses sunlight to generate heat for applications such as water heating without fossil fuels.



Hydro power uses the kinetic energy of moving water to generate electricity for distribution on the electric grid. A map of hydroelectric sites in Wisconsin can be found in the Map Appendix.

Solar photovoltaic uses sunlight to generate electricity to displace energy normally purchased from the electric grid, or to add energy to the electric grid. A map of solar intensity across the United States Wisconsin can be found in the Map Appendix.

Ethanol is a renewable transportation fuel primarily made from corn. It is used as the oxygenate in reformulated gasoline sold in southeastern Wisconsin and as E10 and E85 throughout the state. A listing of ethanol facilities is on the OEI website at: http://energyindependence.wi.gov/docview.asp?docid=11272&locid=160.

Wisconsin Renewable Energy Production, by Type of Fuel

This table includes all renewable energy used in Wisconsin for generating electricity and for other applications that displace fossil fuels (e.g., space heating, transportation fuel).

All the figures for solar energy, biomass and biogas were historically revised in 2007 to more accurately represent a revision to methodology and data sources. For example, this table does not include estimated passive solar, municipal solid waste or other refuse derived fuels (e.g., railroad ties, tires), as have previous publications.

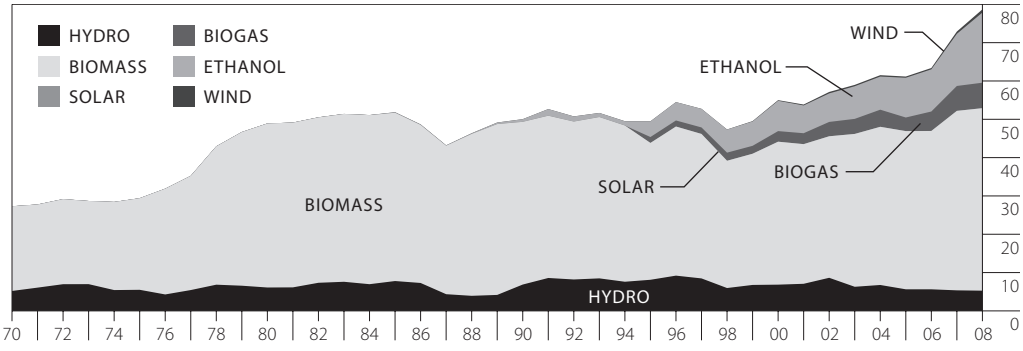
Maps of Wisconsin's hydroelectric sites, wind installations ("wind farms") and U.S. potential for biomass and solar can be found in the Map Appendix starting on page 149.

OVERALL RENEWABLE ENERGY USE 7.9%

Overall renewable energy use in Wisconsin increased 7.9 percent in 2008. Ethanol use in the transportation sector increased 34.6 percent. Hydro generation includes electricity generation by Wisconsin utilities and dams owned by industrial users (e.g., paper mills). Solar energy figures include distributed energy sold to utilities by residential users.

Renewable resource use in Wisconsin is dominated by wood burning for activities displacing fossil fuels (e.g., space heating) and as biomass in electricity generation.

1970-2008 TRILLIONS OF BTU



1970-2008 TRILLIONS OF BTU AND PERCENT OF TOTAL

Year	Hydro		Biomass		Solar		Biogas		Ethanol[a]		Wind		Total
1970	5.2	*19.0%*	22.1	*81.0%*	0.0	*0.0%*	0.0	*0.0%*	0.0	*0.0%*	0.0	*0.0%*	27.3
1975	5.5	*18.7%*	23.9	*81.3%*	0.0	*0.0%*	0.0	*0.0%*	0.0	*0.0%*	0.0	*0.0%*	29.4
1980	6.1	*12.5%*	42.8	*87.5%*	0.0	*0.0%*	0.0	*0.0%*	0.0	*0.0%*	0.0	*0.0%*	48.9
1985	7.8	*15.0%*	43.9	*84.7%*	0.0	*0.0%*	0.0	*0.0%*	0.1	*0.2%*	0.0	*0.0%*	51.8
1990	6.9	*13.7%*	42.5	*84.9%*	0.0	*0.0%*	0.0	*0.0%*	0.7	*1.4%*	0.0	*0.0%*	50.0
1995	8.1	*16.4%*	35.7	*72.2%*	0.0	*0.0%*	1.5	*3.1%*	4.1	*8.3%*	0.0	*0.0%*	49.5
2000	6.8	*12.5%*	37.3	*67.8%*	0.0	*0.0%*	2.8	*5.0%*	7.9	*14.4%*	0.16	*0.3%*	55.0
2001	7.1	*13.1%*	36.4	*67.7%*	0.0	*0.0%*	2.8	*5.3%*	7.3	*13.5%*	0.24	*0.4%*	53.9
2002	8.6	*15.1%*	36.9	*64.6%*	0.00011	*0.0%*	3.7	*6.5%*	7.4	*13.0%*	0.38	*0.7%*	57.1
2003	6.3	*10.7%*	39.9	*67.6%*	0.00132	*0.0%*	3.9	*6.7%*	8.5	*14.4%*	0.36	*0.6%*	59.0
2004	6.8	*11.0%*	41.3	*67.1%*	0.00472	*0.0%*	4.5	*7.3%*	8.7	*14.1%*	0.36	*0.6%*	61.5
2005	5.6	*9.2%*	41.3	*67.5%*	0.00652	*0.0%*	3.5	*5.8%*	10.4	*17.0%*	0.32	*0.5%*	61.2
2006	5.6	*8.9%*	41.3	*65.2%*	0.01227	*0.0%*	5.1	*8.0%*	11.0	*17.4%*	0.35	*0.6%*	63.4
2007	5.4	*7.4%*	46.8	*64.2%*	0.01674	*0.0%*	6.5	*8.9%*	13.6	*18.7%*	0.59	*0.8%*	72.9
2008[p]	**5.3**	***6.7%***	**47.6**	***60.5%***	**0.02728**	***0.0%***	**6.6**	***8.4%***	**18.3**	***23.3%***	**0.83**	***1.1%***	**78.7**

a Ethanol is blended with a petroleum-based fuel to produce reformulated gasoline, E10 and E85.

p Preliminary estimates.

Source: Compiled from tables in this publication (2008).

Wisconsin Renewable Energy Production, by Economic Sector

TOTAL END-USE ENERGY
8.2%

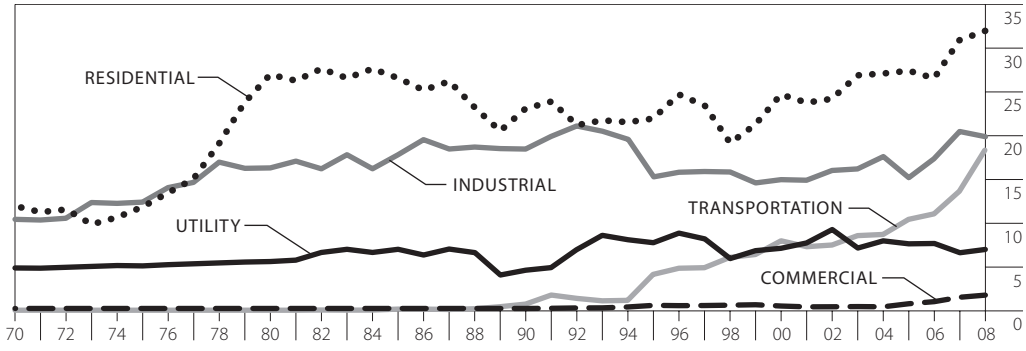
Wisconsin's total end use energy increased by 8.2 percent. The residential and industrial sectors use the most renewable energy, primarily due to woodburning in these sectors. Residential data also include solar hot water and photovoltaic systems. Data reported in the electric sector represents resource energy, meaning that the renewable fuels are used to generate electricity which is sold through the grid. Transportation sector renewable energy measures use of ethanol blended with gasoline and sold as E10 and E85.

This table includes all renewable energy used in Wisconsin for generating electricity and for other applications that displace fossil fuels (e.g., space heating, transportation fuel).

In 2007, the figures in this table were revised to remove non-metered resources such as passive solar energy and resources not considered renewable under Wisconsin law (e.g., municipal solid waste and refuse derived fuel such as railroad ties and tires). This impacted all sectors when compared to previous versions of this publication.

Maps of Wisconsin's hydroelectric sites, wind installations ("wind farms") and U.S. potential for biomass and solar can be found in the Map Appendix starting on page 149.

1970-2008 TRILLIONS OF BTU



1970-2008 TRILLIONS OF BTU AND PERCENT OF TOTAL

Year	Residential		Commercial		Industrial		Electric Utility		Transportation	Total Resources	Total End Use
1970	11.9	*43.6%*	0.2	*0.7%*	10.4	*38.0%*	4.8	*17.7%*	0.0	27.3	22.5
1975	11.8	*40.1%*	0.2	*0.7%*	12.3	*42.0%*	5.1	*17.2%*	0.0	29.4	24.3
1980	26.9	*55.0%*	0.2	*0.4%*	16.2	*33.2%*	5.6	*11.4%*	0.0	48.9	43.3
1985	26.1	*50.4%*	0.2	*0.4%*	18.4	*35.5%*	7.0	*13.5%*	0.1	51.8	44.9
1990	21.1	*42.2%*	0.3	*0.5%*	21.0	*42.0%*	6.9	*13.8%*	0.7	50.0	43.1
1995	21.9	*44.2%*	0.6	*1.1%*	15.2	*30.8%*	7.7	*15.6%*	4.1	49.5	41.8
2000	24.6	*44.8%*	0.5	*0.9%*	14.9	*27.1%*	7.1	*12.9%*	7.9	55.0	47.9
2001	23.7	*44.0%*	0.4	*0.7%*	14.8	*27.6%*	7.7	*14.3%*	7.3	53.9	46.2
2002	24.1	*42.3%*	0.4	*0.7%*	16.0	*27.9%*	9.2	*16.1%*	7.4	57.1	47.9
2003	26.8	*45.5%*	0.4	*0.7%*	16.1	*27.4%*	7.1	*12.0%*	8.5	59.0	51.9
2004	27.0	*43.9%*	0.4	*0.6%*	17.5	*28.5%*	7.9	*12.9%*	8.7	61.5	53.6
2005	27.3	*44.7%*	0.7	*1.2%*	15.1	*24.7%*	7.6	*12.4%*	10.4	61.1	53.6
2006	26.5	*41.8%*	1.0	*1.5%*	17.3	*27.3%*	7.6	*12.0%*	11.0	63.4	55.8
2007p	30.8	*42.3%*	1.5	*2.0%*	20.4	*28.0%*	6.6	*9.0%*	13.6	72.9	66.3
2008p	**31.9**	***40.5%***	**1.7**	***2.2%***	**19.8**	***25.2%***	**6.9**	***8.8%***	**18.3**	**78.7**	**71.7**

p Preliminary estimates.
Source: Compiled from tables in this publication.

Wisconsin Wood Use, by Economic Sector

This table shows wood used in Wisconsin for applications that displace the use of fossil fuels, such as space heating or water heating. Wood used in this table does not represent wood used to generate electricity.

In previous versions of this book, the electric sector was included in this table. Electric sector data is included in the table on page 74.

A map of biomass potential distribution across the United States can be found in the Map Appendix on page 155.

1970-2008 TRILLIONS OF BTU AND PERCENT OF TOTAL

Year	Residential[a]		Commercial		Industrial		Total
1970	11.9	*53.8%*	0.20	*0.9%*	10.0	*45.2%*	22.1
1975	11.8	*49.4%*	0.20	*0.8%*	11.9	*49.8%*	23.9
1980	26.9	*62.9%*	0.20	*0.5%*	15.7	*36.7%*	42.8
1985	26.1	*59.5%*	0.20	*0.5%*	17.6	*40.1%*	43.9
1990	21.1	*51.1%*	0.20	*0.5%*	20.0	*48.4%*	41.3
1995	21.9	*62.9%*	0.24	*0.7%*	12.7	*36.4%*	34.8
1996	24.6	*64.9%*	0.20	*0.5%*	13.1	*34.6%*	37.9
1997	23.4	*63.8%*	0.22	*0.6%*	13.1	*35.6%*	36.6
1998	19.1	*59.3%*	0.26	*0.8%*	12.8	*39.9%*	32.1
1999	21.2	*64.2%*	0.28	*0.9%*	11.5	*34.9%*	33.0
2000	24.6	*68.2%*	0.22	*0.6%*	11.2	*31.1%*	36.1
2001	23.7	*67.3%*	0.21	*0.6%*	11.3	*32.1%*	35.2
2002	24.1	*67.3%*	0.24	*0.7%*	11.5	*32.1%*	35.9
2003	26.8	*69.2%*	0.24	*0.6%*	11.7	*30.2%*	38.7
2004	27.0	*67.6%*	0.23	*0.6%*	12.7	*31.8%*	39.9
2005	27.3	*68.8%*	0.23	*0.6%*	12.2	*30.6%*	39.7
2006	26.5	*70.1%*	0.22	*0.6%*	11.0	*29.3%*	37.7
2007	30.8	*71.1%*	0.32	*0.7%*	12.2	*28.1%*	43.3
2008[p]	**31.9**	***72.6%***	**0.32**	***0.7%***	**11.7**	***26.7%***	**43.9**

WOOD ENERGY USE 1.4%

Wood energy use in Wisconsin increased by 1.4 percent in 2008.

Residential wood use is estimated using a variety of factors including heating degree days, cost of other winter fuels and gross domestic product, the efficiency factor of wood, and the number of households in Wisconsin. The Commercial sector wood use includes schools, hospitals, wholesalers and retailers, and construction.

a Revised.

p Preliminary estimates.

Source: U.S. Department of Energy, Energy Information Administration, *Estimates of U.S. Wood Energy Consumption from 1949 to 1981* (August 1983); Wisconsin Department of Natural Resources, Annual Survey of Point Source Emissions, unpublished (1972-2008); USDA Forest Service, *Residential Fuelwood Consumption and Production in Wisconsin* (1994); Wisconsin Department of Administration, Division of Energy, "Wisconsin Residential Wood Energy Model," unpublished (2008), and *Directory of Wisconsin Wood Burning Facilities* (1995).

Wisconsin Manufacturing Industry Use of Wood Fuel, by Industry Group

The use of wood and wood products as fuel by Wisconsin industries is concentrated among businesses that use or produce a wood product. Lumber mills burn sawdust, bark and scrap wood as a boiler fuel and for kiln drying boards. Furniture and paper companies use scrap wood and wood byproducts for process steam, heating and generating electricity. Wood in Wisconsin is a renewable resource for heating as well as electricity generation.

A map of biomass potential distribution across the United States can be found in the Map Appendix on page 155.

1972-2008 THOUSANDS OF TONS AND TRILLIONS OF BTU[a]

	Lumber		Furniture		Paper & Allied		Other Manufacturing		Total	
Year	(Tons)	(Btu)	(Tons)	(Btu)	(Tons)	(Btu)	(Tons)	(Btu)	(Tons)	(Btu)
1972	391.2	4.42	13.2	0.15	508.5	5.75	16.1	0.18	929.0	10.50
1975	437.2	4.94	24.5	0.28	575.6	6.50	17.1	0.19	1,054.5	11.92
1980	447.5	5.06	56.9	0.64	872.8	9.86	12.0	0.14	1,389.2	15.70
1985	427.3	4.83	53.9	0.61	1,046.7	11.83	33.5	0.38	1,561.3	17.64
1990	490.9	5.55	64.0	0.72	1,186.5	13.41	30.0	0.34	1,771.4	20.02
1995	480.6	5.43	29.3	0.33	592.3	6.69	19.9	0.23	1,637.2	12.68
1996	435.9	4.93	29.9	0.34	676.8	7.65	18.6	0.21	1,161.2	13.12
1997	402.2	4.54	23.2	0.26	712.3	8.05	17.6	0.20	1,155.3	13.05
1998	408.1	4.61	22.1	0.25	693.2	7.83	10.9	0.12	1,134.2	12.82
1999	455.4	5.15	22.7	0.26	535.1	6.05	7.9	0.09	1,021.1	11.54
2000	432.3	4.89	20.1	0.23	534.5	6.04	7.5	0.09	994.5	11.24
2001	419.9	4.74	19.0	0.21	554.5	6.27	8.9	0.10	1,002.3	11.33
2002	415.2	4.69	17.2	0.19	577.5	6.53	9.0	0.10	1,019.0	11.51
2003	384.3	4.34	15.3	0.17	626.9	7.08	8.2	0.09	1,034.7	11.69
2004	434.5	4.91	13.5	0.15	665.5	7.52	10.5	0.12	1,123.9	12.70
2005	421.8	4.77	10.8	0.12	633.4	7.16	10.5	0.12	1,076.5	12.16
2006	356.1	4.02	7.6	0.09	597.3	6.75	16.5	0.19	977.4	11.05
2007	361.3	4.08	7.5	0.08	690.4	7.80	19.3	0.22	1,078.5	12.19
2008[p]	**300.0**	**3.39**	**5.6**	**0.06**	**712.1**	**8.05**	**20.7**	**0.23**	**1,038.5**	**11.73**

a Gross heating values of wood range from 8 MMBtu per ton to 17 MMBtu per ton, due in part to differences in moisture content. In this table, 11.3 MMBtu per ton is used, based on estimates of moisture content and type of wood used in Wisconsin.

p Preliminary estimates.

Source: Estimates by the Wisconsin Office of Energy Independence, based on Wisconsin Department of Natural Resources, Annual Survey of Point Source Emissions, unpublished (1972-2008); Employment Research Associates, *Biomass Resources: Generating Jobs and Energy*, Technical Papers (January 1986); Department of Administration, Division of Energy, *Directory of Wisconsin Wood Burning Facilities* (1995).

Wisconsin Electric Utility Use of Wood Fuel

1970-2008

Year	Tons	Billions of Btu
1970-1975	0	0
1980	76,282	740
1985	155,717	1,666
1990	299,464	3,112
1995	327,201	3,506
1996	339,803	3,837
1997	304,618	3,326
1998	334,231	3,871
1999	330,491	3,765
2000	296,739	3,430
2001	301,580	3,484
2002	283,774	3,260
2003	267,446	3,154
2004	242,973	2,877
2005	253,638	2,961
2006	288,907	3,482
2007	315,811	3,437
2008	**342,684**	**3,735**

Source: Wisconsin Department of Natural Resources, Annual Survey of Point Source Emissions, unpublished (1972-1994); annual reports of various Wisconsin electric generating utilities (1995-2008). http://psc.wi.gov/apps/annlreport/content/munilist.aspx

WOOD ENERGY USED FOR ELECTRICITY

In the utility sector, Northern States Power/ Xcel Energy uses wood for their electricity-generating fuel at the Bay Front and French Island generating plants.

Wood energy used for electricity in Wisconsin increased in 2008 when Northern States Power (NSP) Company increased wood usage at its Bay Front plant.

These figures represent resource energy, before conversion of wood fuel to electricity.

NSP began using wood fuel at Bay Front in 1976 and at its French Island facility in 1980. These are the only electric utility generation sites in Wisconsin using significant amounts of wood.

A map of biomass potential distribution across the United States can be found in the Map Appendix on page 155.

Wisconsin Electric Utility and Non-Utility Hydroelectric Generation

ELECTRIC UTILITY HYDROELECTRIC PRODUCTION
1.3%

Total Wisconsin electric utility hydroelectric production increased 1.3 percent from 2007 to 2008. Because hydroelectric production is impacted by rainfall, among other factors, precipitation inches are provided in this table.

2008 data in this table are preliminary estimates based on available electric production data and previous year's data. These data will be revised as Public Service Commission of Wisconsin data are available.

A map of Wisconsin's hydroelectric sites can be found in the Map Appendix on page 153.

1970-2008 MILLIONS OF kWh

Year	Wisconsin Operated Utility Plant Location		Total Utility[a]	Wisconsin Non-Utility[b]	Total Wisconsin	Total Wisconsin Precipitation (inches per year)
	Wisconsin	MIchigan				
1970	1,413.2	448.1	1,861.3	110.0	1,523.2	32.0
1975	1,482.9	450.3	1,933.2	129.4	1,612.3	32.4
1980	1,628.3	488.9	2,117.2	160.4	1,788.7	32.5
1985	2,046.3	543.6	2,589.9	235.9	2,282.2	37.0
1990[c,r]	1,791.0	340.2	1,865.2	223.4	2,014.4	36.2
1995	2,097.1	440.1	2,537.2	281.4	2,378.5	32.9
1996	2,401.9	500.7	2,902.6	294.1	2,696.0	32.8
1997	2,182.2	458.5	2,640.7	301.1	2,483.3	28.6
1998	1,517.8	324.0	1,841.8	229.6	1,747.4	32.7
1999	1,734.0	416.1	2,150.1	250.6	1,984.6	34.0
2000	1,749.4	369.6	2,119.0	241.4	1,990.8	34.8
2001	1,887.6	383.3	2,270.9	168.6	2,056.2	35.5
2002	2,282.9	485.8	2,768.7	232.1	2,515.0	35.2
2003	1,623.4	373.4	1,996.8	219.9	1,843.3	28.4
2004	1,748.4	401.0	2,149.4	232.3	1,980.7	35.3
2005	1,595.7	338.6	1,934.3	51.7	1,647.4	29.2
2006	1,504.6	326.3	1,830.9	142.2	1,646.8	30.7
2007[r]	1,345.5	272.6	1,618.1	218.8	1,564.3	34.0
2008[p,c]	**1,363.0**	**272.6[b]**	**1,635.6**	**180.0**	**1,568.0**	**34.0**

a Including Wisconsin power cooperatives.

b Estimated.

c Beginning in 1990, the U.S. DOE data source has been used. Starting in 2005, EIA data are revised using unpublished electric production data from the Public Service Commission of Wisconsin. 2008 data are EIA data and will be revised and updated as PSC figures are available.

p Preliminary estimates.

r Revised.

Source: Public Service Commission of Wisconsin, Accounts and Finance Division, *Generating Plants Operated by Wisconsin Electric Utilities*, Bulletin #46 (1971-1994); U.S. Department of Agriculture, Rural Electrification Administration, *Annual Statistical Report*, REA Bulletin 1-1 (1971-1994); Wisconsin Department of Administration, Division of Energy, Wisconsin Hydroelectric Generation Model, unpublished (1994); National Oceanic and Atmospheric Administration, *Monthly State Heating Degree Days, Historical Climatology Series 5-1* (April 2004); U.S. Department of Energy, Energy Information Administration, *Electric Power Monthly* [DOE/EIA-0226 (2009/03)] (March 2009), http://www.eia.doe.gov/cneaf/electricity/epa/epa_sprdshts.html; Public Service Commission of Wisconsin, unpublished electrical production data (2005-2007).

Wisconsin Renewable Energy Electricity Generated and Purchased

In this table, biomass includes wood, paper pellets and black liquor. Biogas includes methane from landfills and agricultural manure digesters burned to generate electricity. Solar generation comes primarily from distributed energy sources such as residences with photovoltaic installations that sell power to the electric utility for distribution on the electric grid.

In 2007 these figures were revised from previous versions of this publication to remove resources that are not considered renewable under Wisconsin law (e.g., municipal solid waste or refuse derived fuels).

Maps of Wisconsin's hydroelectric sites, wind installations ("wind farms") and U.S. potential for biomass and solar can be found in the Map Appendix starting on page 149.

1990-2008 MILLIONS OF KWH AND PERCENT OF TOTAL

Year	Hydro		Biomass		Biogas		Wind		Solar		Total
1990	2,014.4	*96.7%*	68.1	*3.3%*	0.0	*0.0%*	0.0	*0.0%*	0.0	*0.0%*	2,082.5
1995	2,378.5	*93.5%*	54.2	*2.1%*	110.1	*4.3%*	0.0	*0.0%*	0.0	*0.0%*	2,542.8
1996	2,696.0	*94.1%*	56.5	*2.0%*	112.8	*3.9%*	0.0	*0.0%*	0.0	*0.0%*	2,865.3
1997	2,483.3	*93.3%*	57.5	*2.2%*	121.2	*4.6%*	0.0	*0.0%*	0.0	*0.0%*	2,662.0
1998	1,747.4	*89.1%*	60.9	*3.1%*	151.2	*7.7%*	2.2	*0.1%*	0.0	*0.0%*	1,961.6
1999	1,984.6	*89.2%*	68.6	*3.1%*	147.4	*6.6%*	23.7	*1.1%*	0.0	*0.0%*	2,224.3
2000	1,990.8	*86.1%*	78.1	*3.4%*	197.2	*8.5%*	46.6	*2.0%*	0.0	*0.0%*	2,312.8
2001	2,056.2	*85.2%*	83.0	*3.4%*	203.3	*8.4%*	70.2	*2.9%*	0.0	*0.0%*	2,412.7
2002	2,515.0	*84.9%*	70.6	*2.4%*	267.3	*9.0%*	111.1	*3.7%*	0.03	*0.0%*	2,964.0
2003	1,843.3	*79.9%*	79.4	*3.4%*	280.5	*12.2%*	104.0	*4.5%*	0.12	*0.0%*	2,307.4
2004	1,980.7	*79.2%*	98.1	*3.9%*	317.5	*12.7%*	105.3	*4.2%*	0.30	*0.0%*	2,501.9
2005[r]	1,647.4	*77.9%*	148.2	*7.0%*	224.3	*10.6%*	93.5	*4.4%*	0.46	*0.0%*	2,113.8
2006[r]	1,646.8	*57.0%*	815.8	*28.2%*	322.2	*11.2%*	102.7	*3.6%*	0.91	*0.0%*	2,888.4
2007[r]	1,564.3	*51.0%*	914.4	*29.8%*	412.6	*13.4%*	175.0	*5.7%*	1.57	*0.1%*	3,067.9
2008[p]	**1,568.0**	***49.9%***	**914.4**	***29.1%***	**413.7**	***13.2%***	**243.8**	***7.8%***	**3.45**	***0.1%***	**3,143.3**

p Preliminary estimates.

r Revised.

Source: Other renewable energy tables in this publication, unpublished data from the Public Service Commission of Wisconsin, Focus on Energy (2002-2008), the Energy Center of Wisconsin, and OEI telephone surveys of landfills.

SALES FROM RENEWABLE ENERGY
2.5%

In 2008, Wisconsin's electric utilities and non-utilities, such as paper mills, increased their generation and sales of electricity generated from renewable energy sources by 2.5 percent. The primary renewable energy source used was hydropower, which increased 0.2 percent.

Sales of renewable energy comprise approximately 4.5 percent of total electric sales in Wisconsin.